

Amendments to Claims

1. (Currently Amended.) A process of making polytrimethylene terephthalate staple fibers, comprising (a) providing polytrimethylene terephthalate, (b) melt spinning the melted polytrimethylene terephthalate at a temperature of 245-285°C into filaments, (c) quenching the filaments, (d) drawing the quenched filaments, (e) crimping the drawn filaments using a mechanical crimper at a crimp level of 8-30 crimps per inch (~~3-12 crimps/cm~~), (f) relaxing the crimped filaments at a temperature of 50-120°C, and (g) cutting the relaxed filaments into staple fibers having a length of about 0.2-6 inches (~~about 0.5- about 15 cm~~).

2. (Original.) The process of claim 1 wherein the temperature of the relaxation is below about 105°C.

3. (Original.) The process of claim 1 wherein the temperature of the relaxation is about 55 - about 105°C.

4. (Original.) The process of claim 1 wherein the temperature of the relaxation is about 60 - about 100°C.

5. (Original.) The process of claim 1 wherein the relaxation is carried out by heating the crimped filaments in an unconstrained condition.

6. (Original.) The process of claim 1 wherein the drawn filaments are annealed at 85-115°C before crimping.

7. (Original.) The process of claim 6 wherein the annealing is carried out under tension using heated rollers.

8. (Original.) The process of claim 1 wherein the staple fibers are 0.8-6 denier per filament.

9. (Original.) The process of claim 1 wherein the staple fibers are 0.8-3 denier per filament.

10. (Currently Amended.) The process of claim 9, wherein the drawn filaments are annealed at 85-115°C before crimping and the staple fibers have a tenacity of at least 4.0 grams/denier (~~3.53 cN/dtex~~) or higher.

11. (Original.) The process of claim 10 wherein the staple fibers have an elongation of 55% or less.

12. (Twice amended.) The process of claim 1 wherein the process is carried out without annealing the drawn filaments before crimping and the staple fibers have a tenacity of at least 3.5 grams/denier (~~3.1 cN/dtex~~).

13. (Twice amended.) The process of claim 12 wherein the A polytrimethylene terephthalate staple fibers of are 0.8-3 denier per filament, ~~having a length of about 0.2-6 inches (about 0.5- about 15 cm)~~, have a tenacity of 3.5 grams/denier (~~3.1~~

~~cN/dtex) or more, have and a crimp take-up of 10-60%, and containing 8-30 crimps per inch (about 3—about 12 crimps/cm), prepared by the process of claim 12.~~

14. (Currently amended.) The process of claim 12 wherein the polytrimethylene terephthalate staple fibers are A 0.8-3 denier per filament and polytrimethylene terephthalate staple fiber having have a tenacity of 4.0 grams/denier (3.53 cN/dtex) or higher.

15. (Currently amended.) The process of claim 14 wherein the A polytrimethylene terephthalate staple fibers as claimed in claim 14 wherein the staple fiber has have an elongation of 55% or less.

16. (Cancelled.)

17. (Cancelled.)

18. (Cancelled.)

19. (Cancelled.)

20. (Cancelled.)

21. (Currently amended.) The A process of claim 1 preparing a wherein the process further comprises preparing the polytrimethylene terephthalate staple fibers having so that they have a desirable desired crimp take-up by comprising (a) (i) determining the relationship between denier and crimp take-up and (b) (ii) manufacturing staple fibers having a denier selected based upon that determination.

22. (Previously added.) The process of claim 1 wherein the process is carried out without annealing the drawn filaments before crimping.

23. (Previously added.) The process of claim 22 wherein the temperature of the relaxation is below 100°C.

24. (Previously added.) The process of claim 22 wherein the temperature of the relaxation is 80°C or below.

25. (Previously added.) The process of claim 23 wherein the relaxation is carried out by heating the crimped filaments in an unconstrained condition.

26. (Previously added.) The process of claim 24 wherein the relaxation is carried out by heating the crimped filaments in an unconstrained condition for 1-60 minutes.

27. (Previously added.) The process of claim 23 wherein the temperature of the relaxation is 60°C or above for 1-60 minutes.

28. (Previously added.) The process of claim 24 wherein the temperature of the relaxation is 60°C or above.

29. (Previously added.) The process of claim 23 wherein the temperature of the relaxation is 60°C or above and the relaxation is carried out by heating the crimped filaments in an unconstrained condition by passing the filaments through an oven at a rate of 50-200 yards/minute for 6-20 minutes.

30. (Previously added.) The process of claim 24 wherein the temperature of the relaxation is 60°C or above and the relaxation is carried out by heating the crimped filaments in an unconstrained condition by passing the filaments through an oven at a rate of 50-200 yards/minute for 6-20 minutes.

31. (Previously added.) The process of claim 6 wherein the temperature of the relaxation is below 100°C.

32. (Previously added.) The process of claim 6 wherein the temperature of the relaxation is 80°C or below for 1-60 minutes.

33. (Previously added.) The process of claim 31 wherein the relaxation is carried out by heating the crimped filaments in an unconstrained condition.

34. (Previously added.) The process of claim 32 wherein the relaxation is carried out by heating the crimped filaments in an unconstrained condition.

35. (Previously added.) The process of claim 31 wherein the temperature of the relaxation is 60°C or above for 1-60 minutes.

36. (Previously added.) The process of claim 32 wherein the temperature of the relaxation is 60°C or above.

37. (Previously added.) The process of claim 31 wherein the temperature of the relaxation is 60°C or above and the relaxation is carried out by heating the crimped filaments in an unconstrained condition by passing the filaments through an oven at a rate of 50-200 yards/minute for 6-20 minutes.

38. (Previously added.) The process of claim 32 wherein the temperature of the relaxation is 60°C or above and the relaxation is carried out by heating the crimped filaments in an unconstrained condition by passing the filaments through an oven at a rate of 50-200 yards/minute for 6-20 minutes.

39. (Previously added.) The process of claim 31 wherein the annealing is carried out under tension using heated rollers.

40. (Previously added.) The process of claim 32 wherein the annealing is carried out under tension using heated rollers.

41. (Previously added.) The process of claim 36 wherein the annealing is carried out under tension using heated rollers.

42. (Previously added.) The process of claim 39 wherein the annealing is carried out under tension using heated rollers.

43. (Previously added.) The process of claim 1 wherein the drawing is carried out using two-stage drawing.

44. (Previously added.) The process of claim 43 wherein the two stage drawing comprises (a) a first stage drawing at room temperature and (b) the remaining drawing with the fiber immersed in atmospheric steam set to 90-100°C.

45. (Previously added.) The process of claim 44 wherein 80-90% of the total draw is done in the first stage and 10-20% of the drawing is done in the remaining drawing.

46. (Previously added.) The process of claim 43 wherein the two stage drawing comprises (a) a first stage drawing at room temperature and (b) the remaining drawing with the fiber immersed in a heated water spray.

47. (Previously added.) The process of claim 46 wherein 80-90% of the total draw is done in the first stage and then the remaining 10-20% of the draw is done in the remaining drawing.

48. (Currently amended.) The process of claim 4 47 wherein the water spray is heated to 65°C.

49. (Previously added.) The process of claim 1 wherein the drawing is carried out using single-stage drawing.

50. (Previously added.) The process of claim 49 wherein tension and a water spray are applied to the drawn filament after drawing.

51. (Previously added.) The process of claim 1 wherein the drawing is carried out using a draw ratio of about 1.25 - about 4.

52. (Previously added.) The process of claim 43 wherein the drawing is carried out using a draw ratio of about 1.25 - about 4.

53. (Previously added.) The process of claim 45 wherein the drawing is carried out using a draw ratio of about 1.25 - about 4.

54. (Previously added.) The process of claim 47 wherein the drawing is carried out using a draw ratio of about 1.25 - about 4.